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Systematic Risk, and Oil Price and Exchange Rate Sensitivities in Asia-Pacific Stock Markets

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Abstract: This paper examines the relationship between beta risk and realized stock index return in the presence of oil and exchange rate sensitivities for fifteen countries in the Asia-Pacific region using the international factor model. Thirteen of the 15 countries have the expected beta signs and show significant sensitivity to domestic risk when the world stock market is in both up and down modes. In terms of oil sensitivity, only the Philippines and South Korea are oil-sensitive to changes in the oil price in the short run, when the price is expressed in local currency only. Basically no country shows sensitivity to oil price measured in US dollar regardless whether the oil market is up or down. Nine countries are affected by changes in the exchange rate. In terms of relative factor sensitivity distribution, one is willing to conclude that these stock markets are more conditionally sensitive to local currency oil price changes than to beta risk wherever the relationships are significant.

Key words: Asia pacific, stock market, oil price sensitivity, systematic risk, exchange rate.

JEL Classification: C22; F3; Q49

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1. Introduction

In recent years many countries in the Asia-Pacific region have significantly increased their consumption and imports of crude oil, and they now constitute the fastest growing region of oil demand. The International Energy Agency forecasted Asia's total oil demand to grow by 3.2 percent, after growing by 5.3 percent in 2004. This growth is significantly higher than the world growth of oil demand which is usually less than 2 percent and was about 2.4 percent in 2004. Some of these countries were also the best stock market performers in the 1990s. However, during this period they experienced grave financial crises when some of their currencies plummeted by more than 50 percent.

The Asian-Pacific countries covered in this study have various distinctive characteristics. There are those who are developed such as Australia, New Zealand and Japan, developing such as India, Indonesia, Pakistan, and Sri Lanka, and in between such as Korea, Singapore and Taiwan. Some of these countries are net oil importers, while others such as Malaysia is net oil exporter, and Indonesia is an oil producer and is self sufficient. Last, but not least, some of these countries' financial markets were hurt more than others during the 1997 Asian crisis. Therefore, it will be interesting to study the relationship between Asian-Pacific countries' stock market performance and changes in their own domestic risk and in global factors such as the oil price and foreign exchange rates.

Several studies examined the effects of global, country and industry factors on the movements and volatilities of stock returns but not the domestic and global sensitivities under consideration in this paper. Beckers et al. (1995) find that global factors and national factors are of roughly equal importance in explaining the co-movements of stock returns, while national factors are dominant in explaining the

stock return volatility. Moreover, Grinold et al. (1989), Drummen and Zimmermann (1992), and Heston and Rouqwenhorst (1994) all find that national factors dominate stock return volatilities although industry factors play a significant role. Jones and Kaul (1996) study the impact of global oil shocks on the equity prices in Canada, Japan, UK and the US. They find that only in the case of US and Canada can the impact of the oil shocks on real cash completely account for this reaction. Huang et al. (1996) examine the relationship between daily returns of oil futures and US stock returns, using an unrestricted VAR model. They find that oil futures returns lead some individual oil company stock returns but have negligible impact on the broad-based market indices such as the S&P 500. In an industry-specific study, Faff and Brailsford (1999) repot signifincat positive oil price sensitivity of Australian oil and gas, and diversified resources industries. On the other hand, other industries such as paper and packaging, banks and transport seems to exhibit negative sensitivity to oil price hikes. Faf and Brailsford (2000) test the role of an oil price factor in explaining the systematic impact on prices in equity markets. Sadorsky (1999) examines the links between the fuel oil prices and stock prices based on US monthly data from January 1947 to April 1996. Using an unrestricted VAR model, that also includes short-term interest rate and industrial production, Sadorsky highlights the importance of oil price in explaining the movements of the other variables. Ciner (2001) finds a nonlinear linkages between energy shocks and financial markets. More recently, Aminduh and Wohl (2004) examine the relationship between stock prices and political news related to Saddam Hussein's oil contracts. In other geographical areas, Hammoudeh and Choi (2006) examined the long-run relationship among the Gulf's Arab (GCC) stock markets in the presence of the US oil market, the S&P 500 index and the US Treausry bill rate. They found that the T bill rate has direct impact on these markes, while oil and S&P 500 have indirect effects. This finding suggests that local and regional factors are dominant in these markets. Choi and Hammoudeh (2007) compared the conditional volatility between the Gulf Arab (GCC) stock markets and volatility of Mexcio and the oil market within a Markov-switching framework. They found that the crisis-ridden Mexico has the highest volatility for the two regimes, followed by the oil market.GCC markets which are isolated by too many government regulations.

In this paper we examine the relationship between stock market performance, domestic risk, oil price changes and foreign exchange appreciation or depreciation. Therefore, the objectives of the paper are:

- to examine the sensitivity of the short-term stock market returns of fifteen countries in the Asia-Pacific region to domestic risk, particularly when the world stock market is in up and down modes;
- to analyse and compare the oil price sensitivity of short-term (weekly) stock market returns across various Asia pacific countries, when the oil price is expressed in both local currency and US dollar;
- to compare the relative factor sensitivity distribution between systematic risk and oil price changes; and
- to investigate the impact of changes in the exchange rates on stock returns when both the world stock market and the global oil market are in up and down forms.

The paper is organized as follows. After this introduction, Section 2 describes the data. Section 3 presents the empirical approach which includes the unit root tests and the international factor model that characterizes the relationship between risk and returns in the presence of changes in prices of global factors. Section 4 provides the results for the 15 Asia-Pacific countries and Section 5 concludes.

2. Data Description

The sample period for all the financial and oil variables is weekly and covers the period 5/4/94 (May 4 94) to 6/30/04 (June 30 04) resulting into 530 observations. The countries include Australia, China, Hong Kong, India, Indonesia, Japan, Malaysia, New Zealand, Pakistan, Philippines, Singapore, South Korea, Sri Lanka,

Taiwan and Thailand. Most of these countries are net oil importers. Exceptions include Malaysia and Indonesia[1] which are net oil exporters, and Singapore and South Korea which are purely oil importers (see **Table 1**). In terms of quantity of oil imports, Korea was the largest importer in 2003 followed by China and India.

The data used are the differences of logs of weekly values (or weekly continuous compounded returns) of Datastream indices for all variables used in the study. We believe that the use of Datastream indices offers the best choice for cross-country comparisons as they are based on a uniform set of rules. For stock market indices, we use total return indices which show a theoretical growth in value of holding over a specified period, assuming that dividends are re-invested to purchase additional units at the closing price applicable on the ex-dividend date. Exchange rates for all currencies are expressed as one US$ equal to how many units of the other currency (e.g. US$1.000 = A$1.3016) or the domestic currency price of the US dollar. The oil price is determined in the international market and usually quoted in US dollars. This study uses the OPEC oil price in US dollars. Oil prices in domestic prices for respective countries are converted by using the corresponding exchange rates.

China has the highest mean return on its stock market index during the period under consideration, averaging at 11.4 percent on an annualized 52-week basis, compared to 7.3 per cent for the world (see **Table 2-Panel A**). Australia comes second, averaging at 9.9 per cent annualized. Japan, Philippines and Thailand have negative average returns during the period. In terms of volatility as measured by standard deviation, China and South Korea have the highest stock index return volatility reaching average 2.522 percent on annualized basis, compared to 1.050

[1] Indonesia was a net exporter over the period of this study, but has recently become only self-sufficient.

percent for the world. Australia has the lowest return volatility, averaging at 0.905 percent. More than half of the stock markets are skewed to the right, and all have a higher kurtosis than the normal distribution.

Most of the countries experienced on average a depreciation of own currency relative to the US dollar during the sample period, with Indonesia having the largest depreciation (see **Table 2-Panel B**). In contrast, China and New Zealand underwent an appreciation. In terms of standard deviations, Indonesia and South Korea have the highest volatility in their exchange rates, while Hong Kong and China have the lowest volatility. Most of the changes in the exchange rates are skewed to the right.

The annualized average percentage increase in OPEC oil price measured in US dollars is 7.8 percent during the sample period, while the annualized average volatility is 2.567 percent which is greater than the volatility of any of the stock markets included in this study. The oil price expressed in local currencies has the highest annualized average increase in the countries that experienced the greatest depreciation in their exchange rates. The average increase in Indonesia in local currency is 21.8 per cent, and in the Philippines and Sri Lanka is 15.1 per cent. The volatility of oil price in local currencies is also the highest in Indonesia, followed by Thailand. All the changes in oil prices in local currency are skewed to the left, with the exception of Indonesia which is skewed to the right. All the oil Kurtoses are greater than the kurtosis for the normal distribution.

3. Empirical Framework

In this framework, we first test if the oil and financial variables (in log form) have unit roots, which in turn determine whether we need to estimate the equations in first differences instead of levels. Then we use the international factor model to

examine if Asia-pacific stock markets are sensitive to domestic risk and oil price changes.

3.1. Unit Root Tests

These unit root tests should be conducted first in order to determine whether the series are non-stationary in the levels (they *individually* have stochastic trends and do not revert to long-run or average values after a shock hits), and whether they are stationary (they have constant means and variances) in the first differences. In this case the series are called integrated of degree 1, $I(1)$. If a series of a structural variable has a unit root, then a shock that hits it will have permanent effects. The model equations should then be cast in first differences to avoid having spurious regression estimation and inferences.

The Augmented Dickey-Fuller (ADF) and Perron-Phillips tests are used to explore for the existence of unit roots. The results for both tests show that all the oil and financial series (log of) levels are non-stationary, and are also stationary in the first differences at the 5 percent levels (results are available on request). Therefore, we will conduct the analysis in terms of oil price changes, exchange rate changes and stock market returns.

3.2. Returns, risk and oil sensitivity

We initially estimate the unconditional and conditional sectoral systematic risks (betas) within the framework of the international APT model for each stock market. In this estimation we control for the individual stock market's oil sensitivity and integration with the world's aggregate stock market as represented by Datastream World Market Index (WMI). The country-specific investment risk or beta is relevant for traders and managers of portfolios in this region, particularly after the 1997 Asian

crisis. The sensitivity to oil prices may also have bearing on the region's capital markets given the countries' fast growing demand for oil.

The following general equations capture the individual stock market's own risk and the other factors in a standard or aggregate market:

$$dly_{jt} = \gamma_{0j} + \gamma_{1j}\beta_{1jt} + \gamma_{2j}dloillc_t + \gamma_{3j}d97 + e_{jt} \quad (1a)$$

$$dly_{jt} = \gamma_{0j} + \gamma_{1j}\beta_{1jt} + \gamma_{2j}dloilus_t + \gamma_{3j}d97 + e_{jt} \quad (1b)$$

where dly_{jt} is the weekly return for country j's stock index, $dloillc_t$ ($dloilus_t$) is the weekly oil price return for the OPEC oil spot price in local currency (US dollar), and where the data for the risk factor *beta* (β_{1j}) is generated through a 13-week rolling regression estimation process[2]. Further, we use a dummy variable, d97, to represent Asian currency crisis, where d97 = 1 for time between July 1997 to October 1998, and 0 if otherwise. In Eqs.(1a and 1b), β_{1jt} is called the unconditional systematic risk for the jth country because this measure of risk is not different no matter in which direction the aggregate world market moves.

However, investment risk may have different behaviour depending on whether the world market is up (down) and the return is positive (negative) for the same time period under consideration. Many studies have shown that the unconditional systematic risk (betas) and returns may not be related empirically due to the bias created by the combination of positive and negative returns. Therefore, as suggested by Pettengil et al (1995), the markets and the risk should be segregated. We thus examine the relationship between returns and the risk in an up and down markets for

[2] The rolling beta for each country is generated from the rolling regressions:
$dlyj_t = \beta_{0j} + \beta_{1j}dlwmi_t + \gamma_{1j}dloillc_t + e_{jt}$

The correlation between $dloilus_t$ (expressed in the US dollar) and $dlwmi_t$ is -0.048; Thus, there is no multicollinearity problem. This regression was also run for 26 weeks (six months) and the results are basically the same. The correlations with $dloillc_t$ should be lower.

all the country returns when the oil price changes are accounted for. The relationship for each country conditional on the up and down markets is estimated for the following equations:

$$dly_j = \gamma_{0j'} + \gamma_{4j}*du*\beta_j + \gamma_{5j}*(1-du)*\beta_j + \gamma_{6j}*dloillc_t + \gamma_{7j}*d97 + e_j \quad (2a)$$

$$dly_j = \gamma_{0j'} + \gamma_{4j}*du*\beta_j + \gamma_{5j}*(1-du)*\beta_j + \gamma_{6j}*dloilus_t + \gamma_{7j}*d97 + e_j \quad (2b)$$

where du =1 if the world market is up ($dlwmi$ >0) and du = 0 if this market is down ($dlwmi$ <0). The expected sign for γ_{4j} is positive and for γ_{5j} is negative. If this is the case, then it means that high-beta countries outperform low-beta countries when the world market return is positive. Similarly, the high-beta countries incur higher losses when the realized world market return is negative (Tang and Shum, 2003). The sensitivity to the oil variables is tested when the oil price is expressed in local currency ($dloillc_t$), and when it is in US dollars ($dloilus_t$).

We also augmented Eqs. (2) to capture the sensitivity of stock returns when the oil price moves both up and down.

$$dly_j = \gamma_{0j'} + \gamma_{8j}*du*\beta_{jt} + \gamma_{9j}*(1-du)*\beta_{jt} + \gamma_{10j}*do*dloillc_t + \gamma_{11j}*(1-do)*dloillc_t + \gamma_{12j}*d97 + e_j \quad (3a)$$

$$dly_j = \gamma_{0j'} + \gamma_{8j}*du*\beta_{jt} + \gamma_{9j}*(1-du)*\beta_{jt} + \gamma_{10j}*do*dloilus_t + \gamma_{11j}*(1-do)*dloilus_t + \gamma_{12j}*d97 + e_j \quad (3b)$$

where do =1 if the oil market is up ($dloillc_t$ >0 or $dloilus_t$ >0) and do = 0 if this market is down ($dloillc_t$ < 0 or $dloilus_t$ <0). If the stock market belongs to an oil-exporting

country then the expected sign for γ_{10j} is positive and for γ_{11j} is negative. The opposite is expected to be true if the country is an oil-importing country.

Finally, we modify Eqs. (3) by expressing the oil price returns in US dollars and including changes in the exchange rates as another determinant of the countries' stock markets.

$$dly_j = \gamma_{0j'} + \gamma_{8j}*du*\beta_{jt} + \gamma_{9j}*(1-du)*\beta_{jt} + \gamma_{10j}*do*dloilus_t + \gamma_{11j}*(1-do)*dloilus_t + \gamma_{12j}*d97 + \gamma_{13j}dlxr_t + e_j \quad (4)$$

where $dlxr_t$ is the change in the countries exchange rate against the US dollar. Further, we added AR(1) and estimated results for all equations and all countries. We found that AR(1) was significant for China, Pakistan and Sri Lanka. Accordingly, reported results for these countries included AR(1) in the corresponding equations.

4. Results

In Table 3 we examine the relationship between beta risk and realized return in the presence of oil sensitivity for each country in the short-run when the oil price is expressed in local currency (equations 1a-3a). Many studies have shown that at the aggregated market level the unconditional betas and returns as expressed in Eq.(1a) are not related empirically due to the combination of positive and negative returns. The results of this equation in the first row of Table 3 are for the most part consistent with the literature, although there are few exceptions. China and Thailand show a significant but small relationship between their domestic beta risk and their stock market returns at the aggregate market level regardless whether the oil price is measured in terms of local currency or the US dollar as in Eq. (1b) (see Table 4-first row). However, this relationship for these two countries has the wrong signs.

Therefore, as suggested by Pettengil et al (1995), we should segregate the returns to take into account the state of the world market in order to estimate the relationship between beta and realized return conditional on the up and down world markets as will be shown later.

In terms of oil sensitivity in Eq. (1a), only the Philippines and South Korea are oil-sensitive to changes in the oil price in the short run, when the oil price is expressed in local currency. South Korea is the third largest oil importer in the region after Japan and China and its oil demand grows mush faster than that of Japan. The Philippines is frequently plagued with oil shortages, and this in addition to the sharp currency devaluations may account for its pronounced oil sensitivity. None of these countries are sensitive to the oil price when it is measured in the US dollar as in Eq. (1b). This interesting result also shows the importance of changes in country exchange rates in affecting domestic stock returns, especially for those countries that experienced serious financial crisis.

The relationship between beta and realized returns conditional on the up and down world markets is estimated according to Eqs. (2). Table 3 (third row) presents the estimates of the conditional betas for the up and down markets in the presence of oil sensitivity for all the countries when the oil price is measured in local currency as in Eq. (2a). The results are also consistent with those of previous studies on the conditional relationship in the domestic and international markets (see Tang and Shum, 2003; Fletcher, 2000; Isakov, 1999; and Pettengill et al, 1995). Thirteen of the 15 countries have the expected signs and show significant sensitivity to domestic risk when the world stock market in both up and down world modes in the presence of changes in oil price measured in local currency. This implies that the relatively high-beta countries outperform low-beta countries when the world market return is positive

but they incur heavy losses when the world return is negative. The relatively high conditional beta countries include Hong Kong, Malaysia, Singapore and South Korea. The low conditional beta countries include New Zealand, Pakistan, Philippines and Sri Lanka. The remaining countries other than China and Thailand are in between. China and Thailand show risk sensitivity when the world market is only in the down form. Table 4 (third row) gives the same results when the oil price is measured in US dollar as in Eq. (2b).

In terms of oil sensitivity in Eq. (2a) in which oil market is aggregated, the commodity-exporting countries namely Indonesia and Malaysia show significant sensitivity when the oil market is down and the oil price is expressed in local currency. Although Indonesia has reduced its dependence on oil revenues, it seems that its stock market is still sensitive to drops in the oil price when it is expressed in local currency.[3] There is no oil sensitivity under the specification of Eq. (2b) when the oil price is measured in US dollar in any of the countries, excepting Sri Lanka (see Table 4 –Third row). This result is consistent with those of Eq. (1b) at the aggregate stock and oil market levels when the oil price is expressed in US dollar. However, there is more oil sensitivity when the oil market is split into up and down markets as specified in Eq. (3a). The oil exporting countries Indonesia and Malaysia are also negatively sensitive when the oil price is down, while the Philippines shows sensitivity to both up and down oil markets. Sri Lanka is sensitive only when the oil price is down. When the oil price is expressed in US dollar as in Eq. (3b) only Sri Lanka is still affected by the oil price when it is in the down mode. It is possible that lower oil prices affect Sri Lanka's hydroelectric industry as less expensive imported oil is substituted for this domestic alternative source of energy. In terms of relative

[3] Indonesia has become self sufficient only recently (may be after the end of our data period). Thus, this result may change in the future.

factor sensitivity distribution, one is willing to conclude that stock markets are more conditionally sensitive to oil price changes than to beta risk wherever the relationships are significant

When the exchange rate is striped off the oil price in local currency and is included as an independent variable as specified in Eq. (4) and the oil price is expressed in US dollar, the oil sensitivity loses its power within this short run framework (Table 5). This result is also consistent with the previous cases. The sensitivity to changes in the exchange rate becomes significant in a number of countries including Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan and Thailand. This result highlights the fact that a double blow from both the systematic risk and foreign exchange markets increases the sensitivity of the stock market returns in this region.

The sensitivity to the 1997 Asian crisis figured high for seven countries, regardless whether oil is priced in local currency or US dollar. The countries are Hong Kong, Japan, Malaysia and Pakistan at the 5 percent level and for Singapore and Sri Lanka at the 10%. For Indonesia this crisis sensitivity is significant at 5 percent when the global oil is segregated into up and down markets and the oil price is expressed in local currency. Interestingly, for most of these countries this sensitivity is greater in sheer magnitude than that of the beta risk. When the exchange rate is included explicitly in the equations, the Asian crisis sensitivity diminished for most countries since the crisis manifested itself strongly in the exchange rates.

5. Conclusions

This paper examines the relationship between domestic beta risk and realized stock index return in the presence of oil and exchange rate sensitivities for fifteen

countries in the Asia-Pacific region using the international factor model. The results emphasize the importance of using beta risk conditional on the movements of the domestic market relative to that of the world market in examining this relationship.

The findings also underscore the significance of using oil prices expressed in domestic currency to capture the sensitivity of the individual country stock market to changes in the oil price. In this regard, Philippines and South Koreas show the greatest oil price sensitivity. However, in addition to these two countries India, Indonesia, Malaysia, Singapore, Taiwan and New Zealand show a significant relationship between the domestic stock index returns and changes in the exchange rate when stripped off the oil price.

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Table 1: Oil Position and Net Oil Imports for Asia-Pacific Countries

Country	*Position over the sample period 94-04*	*Net Oil Imports (bbl/d) in 2003*
Australia	Net oil importer	**249,478**
China	Net oil importer	2.02 million
Hong Kong	na	na
India	Net oil importer	1.4 million
Indonesia	Net exporter, OPEC member, recently self sufficient	130,000
Japan	Net oil importer	5.45 million
Malaysia	Net oil exporter	294,781
New Zealand	na	na
Pakistan	Net oil importer	298,231
Philippines	Net oil importer	312,000
Singapore	oil importer	746,000
South Korea	oil importer	2.1 million
Sri Lanka	Net oil importer	
Taiwan	Net oil importer	892,200
Thailand	Net oil importer	592,000
World		

Source: http://www.eia.doe.gov/emeu/cabs/contents.html

Table 2: Descriptive Statistics for the Financial and Oil Variables by Country

Country	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
Panel A: Log differences of stock market indices							
Australia	0.0019	0.0727	-0.0899	0.0174	-0.2400	4.6832	67.65
China	0.0022	0.3483	-0.2560	0.0485	1.2871	14.9153	3281.62
Hong Kong	0.0012	0.1273	-0.1439	0.0358	-0.4396	4.4706	64.82
India	0.0012	0.1265	-0.1764	0.0385	-0.3851	4.6963	76.65
Indonesia	0.0010	0.1816	-0.1254	0.0423	0.1595	4.9565	86.78
Japan	-0.0002	0.0933	-0.0911	0.0272	0.0864	3.8171	15.40
Malaysia	0.0002	0.2770	-0.1791	0.0387	0.5935	10.9235	1417.56
New Zealand	0.0015	0.0756	-0.0971	0.0187	-0.4025	5.6128	165.07
Pakistan	0.0015	0.1419	-0.1964	0.0446	-0.3837	5.2377	123.57
Philippines	-0.0005	0.1352	-0.1427	0.0344	0.1100	4.8050	73.02
Singapore	0.0002	0.1067	-0.0888	0.0282	0.0901	4.1858	31.77
South Korea	0.0008	0.1725	-0.1872	0.0485	0.0043	4.0634	24.97
Sri Lanka	0.0016	0.1940	-0.2170	0.0353	-0.0153	8.7498	730.09
Taiwan	0.0007	0.1540	-0.1161	0.0394	0.0576	3.7806	13.75
Thailand	-0.0003	0.1946	-0.1548	0.0484	0.2985	4.3128	45.93
World	0.0014	0.0824	-0.0771	0.0202	-0.2994	4.4155	52.16
Panel B: Log differences of exchange rates							
Australia	0.0000	0.0468	-0.0515	0.0140	0.1214	3.8795	18.38
China	-0.0001	0.0080	-0.0195	0.0016	-4.0199	60.1268	73495.71
Hong Kong	0.0000	0.0032	-0.0052	0.0005	-3.1458	40.5788	32059.52
India	0.0007	0.0355	-0.0377	0.0064	-0.2815	14.9533	3162.30
Indonesia	0.0028	0.5782	-0.2905	0.0524	3.3266	44.3435	38724.24
Japan	0.0001	0.0649	-0.1254	0.0157	-1.1276	11.5498	1726.58
Malaysia	0.0007	0.1367	-0.1137	0.0143	0.6264	40.0361	30325.83
New Zealand	-0.0002	0.0516	-0.0592	0.0140	0.1670	4.2468	36.79
Pakistan	0.0012	0.0835	-0.0753	0.0106	2.6046	30.8847	17770.27
Philippines	0.0014	0.1434	-0.0965	0.0153	2.3591	30.8186	17581.30
Singapore	0.0002	0.0395	-0.0460	0.0076	-0.0289	9.5465	946.50
South Korea	0.0007	0.2686	-0.0823	0.0205	6.3746	80.8343	137374.20
Sri Lanka	0.0014	0.0632	-0.0283	0.0060	2.7065	32.8574	20333.58
Taiwan	0.0005	0.0590	-0.0326	0.0074	2.3126	22.9953	9301.62
Thailand	0.0009	0.1365	-0.1128	0.0166	0.7015	21.9560	7978.64
Panel C: Log differences of oil price in local currency							
Australia	0.0015	0.1636	-0.2153	0.0460	-0.5093	4.5774	77.86
China	0.0014	0.1748	-0.1888	0.0435	-0.3774	4.4316	57.84
Hong Kong	0.0015	0.1746	-0.1888	0.0434	-0.3888	4.4637	60.67
India	0.0022	0.1745	-0.1916	0.0437	-0.3848	4.4423	59.02
Indonesia	0.0042	0.4903	-0.3417	0.0652	0.7060	15.0542	3252.82
Japan	0.0016	0.1649	-0.2060	0.0458	-0.4958	4.4178	66.11
Malaysia	0.0021	0.1526	-0.1972	0.0456	-0.5254	4.7327	90.69

New Zealand	0.0013	0.1788	-0.2230	0.0464	-0.5044	4.7782	92.30
Pakistan	0.0027	0.1848	-0.1896	0.0444	-0.3932	4.5638	67.66
Philippines	0.0029	0.1318	-0.1895	0.0451	-0.4030	4.0762	39.92
Singapore	0.0016	0.1694	-0.1749	0.0440	-0.4046	4.1525	43.79
South Korea	0.0021	0.2262	-0.1846	0.0467	-0.1437	5.1538	104.26
Sri Lanka	0.0029	0.1903	-0.1901	0.0439	-0.3126	4.6188	66.50
Taiwan	0.0019	0.1706	-0.1886	0.0440	-0.4053	4.3301	53.58
Thailand	0.0024	0.1803	-0.1853	0.0468	-0.4737	4.3803	61.89
OPEC(US$)	0.0015	0.1747	-0.1888	0.0434	-0.3864	4.4588	60.18

Notes: All the returns do not have normal distribution as shown by the significance of Jarque-Bera statistics.

Table 3: Risk-returns relationships when oil price is in local currency (Eqs.1a-3a)

Country	*beta-agg*	*beta_ up*	*beta_ down*	*dloillc*	*dloillc_ up*	*dloillc_ down*	*d97*	*AR(1)*	*adjR2*	*DW*
Australia	-0.0022			0.0111			-0.0009		-0.0022	2.07
	(-1.09)			(0.68)			(-0.39)			
		0.0082	-0.0174	0.0155			0.0008		0.2791	2.16
		(4.43)	(-8.63)	(1.11)			(0.44)			
		0.0081	-0.0175		-0.0061	0.0339	0.0009		0.2789	2.16
		(4.37)	(-8.66)		(-0.22)	(1.38)	(0.49)			
China	-0.0073			-0.0103			-0.0094	0.1556	0.0376	2.15
	(-3.34)			(-0.23)			(-1.37)	**(3.80)**		
		-0.0004	-0.0143	-0.0039			-0.0096	0.1557	0.0613	2.12
		(-0.15)	(-4.99)	(-0.09)			(-1.41)	**(3.75)**		
		-0.0006	-0.0142		-0.1215	0.1010	-0.0093	0.1544	0.0640	2.13
		(-0.21)	(-4.96)		(-1.40)	(1.26)	(-1.37)	**(3.72)**		
Hong Kong	0.0007			0.0395			-0.0087		0.0038	1.93
	(0.29)			(1.10)			(-1.88)			
		0.0125	-0.0152	0.0403			-0.0086		0.2363	2.02
		(5.48)	(-6.24)	(1.28)			(-2.11)			
		0.0126	-0.0152		0.0161	0.0616	-0.0085		0.2351	2.02
		(5.49)	(-6.20)		(0.26)	(1.10)	(-2.10)			
India	-0.0035			0.0005			-0.0059		0.0019	1.95
	(-1.59)			(0.01)			(-1.18)			
		0.0090	-0.0202	0.0065			-0.0041		0.1026	2.02
		(3.43)	(-6.73)	(0.18)			(-0.87)			
		0.0089	-0.0201		-0.0461	0.0538	-0.0041		0.1022	2.01
		(3.37)	(-6.67)		(-0.65)	(0.82)	(-0.86)			
Indonesia	-0.0023			-0.0412			-0.0082		0.0058	1.91
	(-0.92)			(-1.45)			(-1.48)			
		0.0095	-0.0174	-0.0361			-0.0078		0.0976	1.99
		(3.29)	(-5.50)	(-1.33)			(-1.47)			
		0.0097	-0.0170		0.0299	-0.1136	-0.0114		0.1019	2.02
		(3.37)	(-5.41)		(0.67)	(-2.28)	(-2.03)			
Japan	0.0020			0.0108			-0.0055		0.0013	2.14
	(0.84)			(0.41)			(-1.57)			
		0.0107	-0.0132	0.0224			-0.0069		0.2025	2.00
		(4.64)	(-5.19)	(0.96)			(-2.18)			
		0.0107	-0.0132		0.0277	0.0180	-0.0069		0.2009	2.00
		(4.64)	(-5.17)		(0.58)	(0.43)	(-2.18)			
Malaysia	0.0023			-0.0558			-0.0161		0.0166	1.99
	(0.99)			(-1.51)			(-3.08)			
		0.0119	-0.0101	-0.0509			-0.0160		0.0939	2.06
		(4.50)	(-3.49)	(-1.43)			(-3.19)			
		0.0118	-0.0102		0.0417	-0.1291	-0.0171		0.0962	2.08
		(4.48)	(-3.55)		(0.59)	(-2.07)	(-3.38)			
New Zealand	-0.0027			-0.0112			-0.0036		0.0047	2.04
	(-1.27)			(-0.64)			(-1.47)			
		0.0079	-0.0161	-0.0103			-0.0031		0.1564	2.00
		(3.48)	(-6.68)	(-0.64)			(-1.38)			

		0.0077	-0.0162		-0.0422	0.0167	-0.0030		0.1570	2.00
		(3.39)	(-6.73)		(-1.34)	(0.60)	(-1.31)			
Pakistan	-0.0020			0.0057			-0.0114	0.1196	0.0174	2.01
	(-0.82)			(0.13)			(-1.71)	**(2.72)**		
		0.0083	-0.0165	-0.0042			-0.0140	0.1071	0.0752	2.01
		(2.79)	(-4.77)	(-0.10)			(-2.18)	**(2.43)**		
		0.0081	-0.0166		-0.0773	0.0630	-0.0135	0.1133	0.0753	2.01
		(2.69)	(-4.79)		(-0.94)	(0.82)	(-2.09)	**(2.57)**		
Philippines	-0.0016			-0.1091			-0.0070		0.0227	1.87
	(-0.70)			(-3.32)			(-1.52)			
		0.0090	-0.0152	-0.1116			-0.0060		0.1282	2.00
		(3.55)	(-5.53)	(-3.59)			(-1.39)			
		0.0090	-0.0152		-0.1051	-0.1176	-0.0061		0.1265	2.01
		(3.55)	(-5.52)		(-1.74)	(-2.05)	(-1.40)			
Singapore	0.0008			0.0012			-0.0058		-0.0009	1.88
	(0.34)			(0.04)			(-1.57)			
		0.0116	-0.0166	0.0007			-0.0059		0.1735	1.89
		(4.96)	(-6.20)	(0.03)			(-1.77)			
		0.0118	-0.0164		-0.0609	0.0543	-0.0056		0.1751	1.87
		(5.02)	(-6.09)		(-1.21)	(1.19)	(-1.69)			
South Korea	-0.0006			-0.1336			-0.0086		0.0142	2.03
	(-0.25)			(-2.94)			(-1.35)			
		0.0125	-0.0151	-0.1095			-0.0061		0.1454	2.07
		(4.47)	(-5.23)	(-2.58)			(-1.03)			
		0.0126	-0.0150		-0.1325	-0.0881	-0.0058		0.1439	2.07
		(4.48)	(-5.19)		(-1.65)	(-1.15)	(-0.96)			
Sri Lanka	-0.0013			-0.0457			-0.0091	0.1204	0.0178	1.99
	(-0.49)			(-1.30)			(-1.75)	**(2.74)**		
		0.0061	-0.0112	-0.0526			-0.0079	0.1132	0.0452	2.00
		(1.96)	(-3.16)	(-1.52)			(-1.55)	**(2.56)**		
		0.0060	-0.0114		0.0378	-0.1394	-0.0081	0.1190	0.0483	2.00
		(1.92)	(-3.22)		(0.58)	(-2.19)	(-1.58)	**(2.68)**		
Taiwan	-0.0009			-0.0233			-0.0054		-0.0027	1.95
	(-0.38)			(-0.59)			(-1.06)			
		0.0101	-0.0178	-0.0197			-0.0056		0.1034	1.96
		(3.71)	(-5.63)	(-0.53)			(-1.16)			
		0.0101	-0.0178		-0.0217	-0.0179	-0.0056		0.1016	1.96
		(3.71)	(-5.62)		(-0.30)	(-0.27)	(-1.16)			
Thailand	-0.0048			-0.0255			0.0002		0.0051	1.88
	(-2.27)			(-0.56)			(0.03)			
		0.0016	-0.0180	-0.0258			0.0009		0.0782	1.88
		(0.70)	(-6.25)	(-0.59)			(0.14)			
		0.0015	-0.0181		-0.0766	0.0179	0.0016		0.0773	1.87
		(0.65)	(-6.28)		(-0.89)	(0.23)	(0.25)			

Notes: In cases of China, Pakistan and Sri Lanka AR(1) was found significant. Accordingly, estimates for these countries include AR(1) term in the regression equations.

Table 4: Risk-returns relationships when oil price is in US$ (Eqs, 1b-3b)

Country	*beta-agg*	*beta_up*	*beta_ down*	*dloilus*	*dloilus_ up*	*dloilus_ down*	*d97*	*AR(1)*	*adjR2*	*DW*
Australia	-0.0022			0.0194			-0.0008		-0.0007	2.08
	(-1.10)			(1.11)			(-0.35)			
		0.0082	-0.0173	0.0176			0.0009		0.2793	2.16
		(4.41)	(-8.62)	(1.18)			(0.47)			
		0.0081	-0.0175		-0.0113	0.0428	0.0010		0.2798	2.16
		(4.36)	(-8.67)		(-0.39)	(1.62)	(0.51)			
China	-0.0073			-0.0100			-0.0094	0.1556	0.0376	2.15
	(-3.34)			(-0.22)			(-1.37)	**(3.80)**		
		-0.0004	-0.0143	-0.0034			-0.0096	0.1557	0.0613	2.12
		(-0.15)	(-4.99)	(-0.08)			(-1.41)	**(3.75)**		
		-0.0006	-0.0142		-0.1203	0.0998	-0.0093	0.1541	0.0639	2.13
		(-0.21)	(-4.96)		(-1.37)	(1.24)	(-1.37)	**(3.71)**		
Hong Kong	0.0007			0.0399			-0.0087		0.0039	1.93
	(0.29)			(1.11)			(-1.88)			
		0.0125	-0.0152	0.0405			-0.0086		0.2363	2.02
		(5.48)	(-6.24)	(1.28)			(-2.11)			
		0.0126	-0.0152		0.0247	0.0543	-0.0085		0.2349	2.02
		(5.48)	(-6.21)		(0.40)	(0.96)	(-2.11)			
India	-0.0035			0.0160			-0.0058		0.0022	1.96
	(-1.60)			(0.41)			(-1.16)			
		0.0090	-0.0202	0.0188			-0.0040		0.1030	2.02
		(3.43)	(-6.73)	(0.51)			(-0.84)			
		0.0089	-0.0202		-0.0036	0.0384	-0.0039		0.1015	2.02
		(3.39)	(-6.71)		(-0.05)	(0.58)	(-0.83)			
Indonesia	-0.0023			-0.0026			-0.0086		0.0017	1.90
	(-0.93)			(-0.06)			(-1.54)			
		0.0096	-0.0174	-0.0147			-0.0082		0.0947	1.99
		(3.30)	(-5.52)	(-0.36)			(-1.54)			
		0.0096	-0.0174		-0.0003	-0.0273	-0.0083		0.0930	1.99
		(3.31)	(-5.51)		(-0.00)	(-0.37)	(-1.55)			
Japan	0.0020			0.0088			-0.0055		0.0012	2.14
	(0.84)			(0.32)			(-1.57)			
		0.0107	-0.0132	0.0121			-0.0069		0.2014	2.00
		(4.63)	(-5.16)	(0.49)			(-2.19)			
		0.0106	-0.0133		-0.0145	0.0354	-0.0069		0.2005	1.99
		(4.58)	(-5.19)		(-0.30)	(0.80)	(-2.18)			
Malaysia	0.0024			0.0118			-0.0160		0.0125	1.99
	(1.04)			(0.30)			(-3.05)			
		0.0120	-0.0100	0.0094			-0.0160		0.0903	2.07
		(4.55)	(-3.46)	(0.25)			(-3.18)			
		0.0120	-0.0103		0.0891	-0.0603	-0.0161		0.0914	2.07
		(4.53)	(-3.54)		(1.21)	(-0.90)	(-3.19)			
New Zealand	-0.0027			-0.0024			-0.0036		0.0040	2.04
	(-1.27)			(-0.13)			(-1.46)			
		0.0079	-0.0162	-0.0062			-0.0031		0.1559	2.00

		(3.48)	(-6.69)	(-0.36)			(-1.38)			
		0.0077	-0.0163		-0.0418	0.0248	-0.0030		0.1567	2.00
		(3.42)	(-6.74)		(-1.23)	(0.81)	(-1.33)			
Pakistan	-0.0020			0.0046			-0.0114	0.1197	0.0174	2.01
	(-0.83)			(0.10)			(-1.70)	**(2.73)**		
		0.0083	-0.0165	-0.0051			-0.0140	0.1070	0.0752	2.01
		(2.79)	(-4.77)	(-0.12)			(-2.18)	**(2.43)**		
		0.0081	-0.0164		-0.0601	0.0436	-0.0138	0.1108	0.0743	2.01
		(2.71)	(-4.74)		(-0.70)	(0.55)	(-2.14)	**(2.51)**		
Philippines	-0.0019			-0.0279			-0.0068		0.0030	1.89
	(-0.84)			(-0.81)			(-1.46)			
		0.0087	-0.0155	-0.0409			-0.0060		0.1089	2.02
		(3.41)	(-5.60)	(-1.25)			(-1.36)			
		0.0087	-0.0155		-0.0400	-0.0417	-0.0060		0.1072	2.02
		(3.41)	(-5.59)		(-0.62)	(-0.71)	(-1.36)			
Singapore	0.0008			0.0167			-0.0056		-0.0002	1.89
	(0.36)			(0.58)			(-1.54)			
		0.0116	-0.0166	0.0125			-0.0058		0.1738	1.90
		(4.97)	(-6.19)	(0.48)			(-1.75)			
		0.0118	-0.0163		-0.0441	0.0620	-0.0057		0.1749	1.88
		(5.02)	(-6.08)		(-0.86)	(1.33)	(-1.71)			
South Korea	-0.0008			-0.0273			-0.0087		-0.0018	2.05
	(-0.30)			(-0.55)			(-1.35)			
		0.0127	-0.0155	-0.0253			-0.0062		0.1348	2.09
		(4.48)	(-5.34)	(-0.55)			(-1.03)			
		0.0127	-0.0154		-0.0723	0.0157	-0.0060		0.1337	2.07
		(4.49)	(-5.33)		(-0.80)	(0.19)	(-1.01)			
Sri Lanka	-0.0013			-0.0465			-0.0092	0.1205	0.0179	1.99
	(-0.50)			(-1.31)			(-1.76)	**(2.75)**		
		0.0061	-0.0112	-0.0529			-0.0079	0.1133	0.0452	2.00
		(1.94)	(-3.16)	(-1.51)			(-1.55)	**(2.57)**		
		0.0060	-0.0115		0.0361	-0.1319	-0.0081	0.1174	0.0475	2.00
		(1.92)	(-3.23)		(0.53)	(-2.09)	(-1.58)	**(2.65)**		
Taiwan	-0.0009			0.0159			-0.0052		-0.0031	1.95
	(-0.36)			(0.40)			(-1.01)			
		0.0101	-0.0177	0.0153			-0.0054		0.1032	1.96
		(3.73)	(-5.62)	(0.40)			(-1.12)			
		0.0101	-0.0177		0.0190	0.0121	-0.0054		0.1015	1.96
		(3.73)	(-5.61)		(0.25)	(0.18)	(-1.12)			
Thailand	-0.0048			0.0240			0.0004		0.0050	1.89
	(-2.27)			(0.49)			(0.06)			
		0.0016	-0.0179	0.0100			0.0010		0.0776	1.89
		(0.70)	(-6.24)	(0.21)			(0.16)			
		0.0016	-0.0179		-0.1117	0.1163	0.0013		0.0800	1.87
		(0.69)	(-6.23)		(-1.21)	(1.38)	(0.20)			

Notes: In cases of China, Pakistan and Sri Lanka AR(1) was found significant. Accordingly, estimates for these countries include AR(1) term in the regression equations.

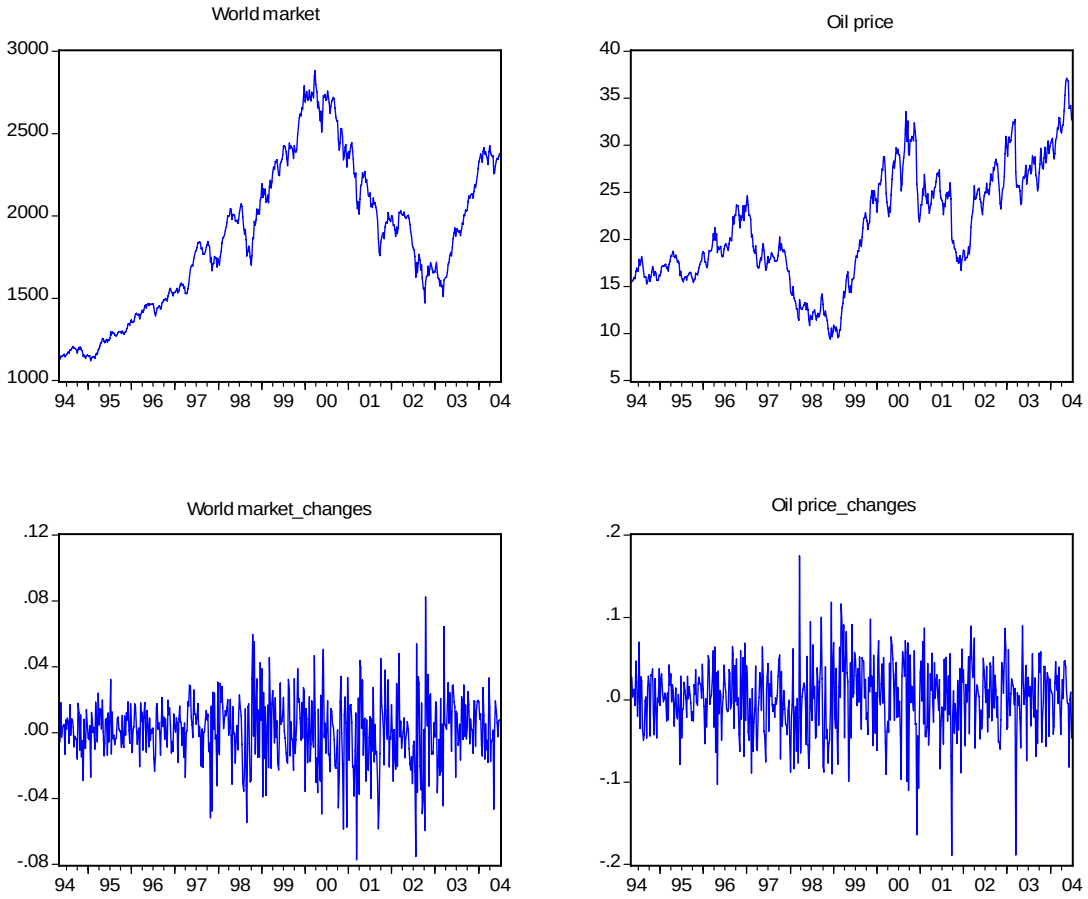
Table 5: Risk-returns relationships when oil price is in US$ in presence of exchange rate

Country	*beta-agg*	*beta_up*	*beta_down*	*dloilus*	*dloilus_up*	*dloilus_down*	*dlxr*	*d97*	*AR(1)*	*adjR2*	*DW*
Australia	-0.0022			0.0203			-0.0684	-0.0006		0.0005	2.08
	(-1.08)			(1.16)			(-1.26)	(-0.25)			
		0.0082	-0.0173	0.0176			-0.0033	0.0009		0.2779	2.16
		(4.41)	(-8.58)	(1.18)			(-0.07)	(0.48)			
		0.0081	-0.0174		-0.0116	0.0432	-0.0075	0.0010		0.2784	2.16
		(4.35)	(-8.63)		(-0.40)	(1.62)	(-0.16)	(0.52)			
China	-0.0073			-0.0097			-0.2679	-0.0094	0.1561	0.0358	2.15
	(-3.35)			(-0.21)			(-0.22)	(-1.36)	**(3.80)**		
		-0.0004	-0.0143	-0.0031			-0.3105	-0.0096	0.1564	0.0596	2.12
		(-0.16)	(-4.99)	(-0.07)			(-0.26)	(-1.41)	**(3.76)**		
		-0.0006	-0.0142		-0.1194	0.0994	-0.2290	-0.0093	0.1546	0.0621	2.13
		(-0.21)	(-4.96)		(-1.36)	(1.24)	(-0.19)	(-1.37)	**(3.72)**		
Hong Kong	0.0007			0.0400			-3.2187	-0.0087		0.0038	1.93
	(0.29)			(1.11)			(-0.99)	(-1.89)			
		0.0125	-0.0152	0.0406			-1.5066	-0.0086		0.2352	2.02
		(5.46)	(-6.22)	(1.28)			(-0.53)	(-2.12)			
		0.0126	-0.0152		0.0234	0.0556	-1.5498	-0.0086		0.2339	2.02
		(5.47)	(-6.19)		(0.38)	(0.98)	(-0.54)	(-2.11)			
India	-0.0033			0.0142			-0.7040	-0.0045		0.0142	1.96
	(-1.55)			(0.37)			(-2.70)	(-0.90)			
		0.0088	-0.0197	0.0173			-0.5563	-0.0030		0.1100	2.02
		(3.37)	(-6.58)	(0.47)			(-2.23)	(-0.64)			
		0.0087	-0.0197		-0.0072	0.0387	-0.5577	-0.0030		0.1085	2.02
		(3.33)	(-6.55)		(-0.10)	(0.59)	(-2.24)	(-0.62)			
Indonesia	-0.0024			-0.0086			-0.0628	-0.0076		0.0058	1.91
	(-0.97)			(-0.20)			(-1.76)	(-1.36)			
		0.0093	-0.0173	-0.0190			-0.0475	-0.0075		0.0964	1.99
		(3.23)	(-5.49)	(-0.46)			(-1.40)	(-1.40)			
		0.0094	-0.0173		-0.0088	-0.0279	-0.0473	-0.0075		0.0947	1.99
		(3.23)	(-5.48)		(-0.11)	(-0.38)	(-1.39)	(-1.40)			
Japan	0.0021			0.0090			0.0247	-0.0056		-0.0006	2.14
	(0.85)			(0.33)			(0.32)	(-1.57)			
		0.0109	-0.0132	0.0129			0.1000	-0.0070		0.2031	2.00
		(4.74)	(-5.18)	(0.52)			(1.46)	(-2.20)			
		0.0108	-0.0133		-0.0087	0.0318	0.0970	-0.0069		0.2020	1.99
		(4.69)	(-5.20)		(-0.18)	(0.72)	(1.41)	(-2.19)			
Malaysia	0.0021			0.0127			-0.6894	-0.0117		0.0747	2.05
	(0.95)			(0.34)			(-5.96)	(-2.29)			
		0.0110	-0.0093	0.0104			-0.6211	-0.0121		0.1402	2.11
		(4.28)	(-3.31)	(0.29)			(-5.55)	(-2.45)			
		0.0110	-0.0095		0.0778	-0.0485	-0.6167	-0.0122		0.1406	2.11
		(4.26)	(-3.37)		(1.08)	(-0.74)	(-5.51)	(-2.47)			
New Zealand	-0.0025			-0.0000			-0.1002	-0.0032		0.0078	2.07
	(-1.15)			(-0.00)			(-1.72)	(-1.30)			
		0.0079	-0.0159	-0.0049			-0.0539	-0.0029		0.1559	2.02
		(3.50)	(-6.54)	(-0.28)			(-1.00)	(-1.28)			
		0.0078	-0.0160		-0.0426	0.0282	-0.0588	-0.0028		0.1570	2.01

		(3.44)	(-6.59)		(-1.26)	(0.91)	(-1.09)	(-1.22)			
Pakistan	-0.0020			0.0047			0.0237	-0.0115	0.1193	0.0155	2.01
	(-0.82)			(0.10)			(0.13)	(-1.71)	**(2.71)**		
		0.0083	-0.0165	-0.0051			0.0113	-0.0140	0.1069	0.0734	2.01
		(2.79)	(-4.76)	(-0.12)			(0.06)	(-2.18)	**(2.42)**		
		0.0081	-0.0164		-0.0600	0.0435	0.0048	-0.0138	0.1107	0.0725	2.01
		(2.71)	(-4.73)		(-0.70)	(0.55)	(0.03)	(-2.14)	**(2.50)**		
Philippines	-0.0020			-0.0407			-0.7409	-0.0028		0.1107	1.92
	(-0.90)			(-1.24)			(-7.95)	(-0.63)			
		0.0076	-0.0142	-0.0511			-0.6677	-0.0024		0.1953	2.05
		(3.13)	(-5.37)	(-1.64)			(-7.49)	(-0.58)			
		0.0076	-0.0142		-0.0764	-0.0290	-0.6706	-0.0023		0.1941	2.05
		(3.11)	(-5.37)		(-1.25)	(-0.52)	(-7.50)	(-0.56)			
Singapore	0.0006			0.0167			-0.5076	-0.0047		0.0164	1.92
	(0.25)			(0.59)			(-3.11)	(-1.29)			
		0.0112	-0.0164	0.0126			-0.3879	-0.0051		0.1830	1.93
		(4.81)	(-6.16)	(0.49)			(-2.60)	(-1.53)			
		0.0114	-0.0161		-0.0498	0.0672	-0.3983	-0.0049		0.1846	1.91
		(4.87)	(-6.04)		(-0.98)	(1.45)	(-2.67)	(-1.49)			
South Korea	0.0002			-0.0440			-0.5814	-0.0050		0.0562	2.04
	(0.07)			(-0.92)			(-5.71)	(-0.80)			
		0.0125	-0.0136	-0.0390			-0.4701	-0.0034		0.1717	2.09
		(4.51)	(-4.77)	(-0.87)			(-4.88)	(-0.58)			
		0.0125	-0.0136		-0.1225	0.0334	-0.4802	-0.0031		0.1720	2.07
		(4.52)	(-4.74)		(-1.38)	(0.42)	(-4.97)	(-0.53)			
Sri Lanka	-0.0013			-0.0464			-0.0109	-0.0092	0.1205	0.0159	1.99
	(-0.50)			(-1.31)			(-0.04)	(-1.75)	**(2.74)**		
		0.0061	-0.0112	-0.0527			-0.0494	-0.0079	0.1132	0.0434	2.00
		(1.95)	(-3.15)	(-1.50)			(-0.20)	(-1.55)	**(2.56)**		
		0.0060	-0.0115		0.0367	-0.1321	-0.0601	-0.0081	0.1174	0.0458	2.00
		(1.93)	(-3.22)		(0.53)	(-2.09)	(-0.24)	(-1.57)	**(2.65)**		
Taiwan	-0.0021			0.0143			-1.3739	-0.0023		0.0615	1.97
	(-0.87)			(0.37)			(-6.03)	(-0.45)			
		0.0084	-0.0178	0.0139			-1.2347	-0.0028		0.1549	1.98
		(3.17)	(-5.81)	(0.38)			(-5.69)	(-0.58)			
		0.0084	-0.0178		0.0034	0.0230	-1.2362	-0.0027		0.1533	1.98
		(3.16)	(-5.80)		(0.05)	(0.35)	(-5.69)	(-0.58)			
Thailand	-0.0054			0.0286			-0.3727	0.0028		0.0194	1.90
	(-2.59)			(0.59)			(-2.92)	(0.44)			
		0.0008	-0.0179	0.0141			-0.2814	0.0028		0.0850	1.89
		(0.35)	(-6.24)	(0.30)			(-2.27)	(0.45)			
		0.0007	-0.0178		-0.1192	0.1308	-0.2944	0.0032		0.0883	1.88
		(0.33)	(-6.24)		(-1.29)	(1.56)	(-2.37)	(0.51)			

Notes: In cases of China, Pakistan and Sri Lanka AR(1) was found significant. Accordingly, estimates for these countries include AR(1) term in the regression equations.

Figure1: A graphic view of the world stock market and the Oil price.



Notes:
The world stock market is represented by Datastream World Market Index, and the Oil price is the OPEC oil price in US dollars. In both cases, the data frequency is weekly. The changes (world stock market and oil price) indicate differences of logs of weekly values (or weekly continuous compounded returns).